CLAIMS

WHAT IS CLAIMED IS:

1. A method for providing XON/XOFF port-level flow control for a computer network that has access to a plurality of network processors in communication with the computer network, wherein at least one network processor is composed of an egress port associated with an egress buffer, and a set of network processors is associated with a bridge, the method comprising the steps of:

determining if the depth of an egress buffer for an egress port has reached a high watermark;

generating an XOFF message associated with the egress port if the egress buffer has reached the high watermark; and

sending the XOFF message to the network processors, wherein the network processors will stop sending cells to the egress port associated with the XOFF message in response to receiving the XOFF message.

2. The method of claim 1,

wherein the computer system further comprises a switch fabric; and

wherein the network processors are in operative communication with the switch fabric via the associated bridge.

3. The method of claim 2, wherein the step of sending the XOFF message to the network processors further comprises the steps of:

forwarding the XOFF message to the switch fabric; and

forwarding the XOFF message to the bridges.

4. The method of claim 3, further comprising the steps of:

determining if the depth of an egress buffer for an egress port has reached a low watermark;

generating an XON message associated with the egress port if the egress buffer has reached the low watermark; and

sending the XON message to the network processors, wherein the network processors will resume sending cells to the egress port associated with the XON message in response to receiving the XON message.

5. The method of claim 4, wherein the step of sending the XON message to the network processors, further comprises the steps of:

forwarding the XON message to the switch fabric; and

forwarding the XON message to the bridges.

6. The method of claim 5, wherein the bridge maintains a VOQ for each egress port of each network processor associated with the bridge, wherein each VOQ is associated with a VOQ egress buffer.

7. The method of claim 6, wherein the step of generating the XOFF message further comprises the steps of:

generating a congestion indication message associated with the egress port if the VOQ egress buffer has reached a high watermark, wherein the egress port is associated with a network processor; and

sending the congestion indication message to the network processor associated with the egress port, wherein the network processor associated with the egress port generates the XOFF message in response to receiving the congestion indication message.

8. The method of claim 7, wherein the step of generating the XON message further comprises the steps of:

generating a congestion cleared indication message associated with the egress port if the VOQ egress buffer has reached a low watermark, wherein the egress port is associated with a network processor; and

sending the congestion cleared indication message to the network processor associated with the egress port, wherein the network processor associated with the egress port generates the XON message in response to receiving the congestion cleared message.

9. The method of claim 8, further comprising the steps of:

determining if a cell is discardable; and

discarding the cell if the depth of the egress buffer for the egress port has reached a high watermark.

10. The method of claim 2, wherein the switch fabric comprises a plurality of switch ports, wherein each switch port is in operative communication with a bridge and is associated with a switch VOQ, wherein each switch VOQ is associated with an VOQ ingress buffer.

11. The method of claim 10, further comprising the steps of:

determining if the depth of a VOQ egress buffer for an switch port has reached a high watermark;

generating an XOFF message associated with the switch port if the VOQ egress buffer has reached the high watermark; and

sending the XOFF message to the network processors, wherein the network processors will stop sending cells to the network processors associated with the bridge coupled to the switch port associated with the XOFF message in response to receiving the XOFF message.

12. The method of claim 11, further comprising the steps of:

determining if the depth of a VOQ egress buffer for an switch port has reached a low watermark;

generating an XON message associated with the switch port if the VOQ egress buffer has reached the low watermark; and

sending the XON message to the network processors, wherein the network processors will resume sending cells to the network processors associated with the bridge coupled to the switch port associated with the XON message in response to receiving the XON message.